	Application No.	Applicant(s)
Notice of Allowability	09/942,408	FURUKAWA ET AL.
	Examiner	**Art Unit**
	John Pezzlo	2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendment filed 20 July 2005*.

2. ☒ The allowed claim(s) is/are *2-29, 38-62, 70-81, 86-113, 120-122, 125-127 (renumbered 1-99)*.

3. ☒ The drawings filed on *29 August 2001* are accepted by the Examiner.

4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some*   c)☐ None   of the:

        1. ☒ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a)☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1)☐ hereto or 2)☐ to Paper No./Mail Date _____ .

    (b)☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

    Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 6/15/05, 7/15/04, 26 May 04

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

JOHN PEZZLO
PRIMARY EXAMINER

DETAILED ACTION

Allowable Subject Matter

Claims 2-29, 38-62, 70-81, 86-113, 120-122, and 125-127 are allowable over the prior art of record.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: Applicants have claimed the following uniquely distinct features in the instant invention, which are not found in the prior art, either singularly or in combination:

1.   Regarding claim 2 - A radio network comprising: at least one core node connected to a wired network, relay nodes, each of the relay nodes relaying at least one of a down-link data packet transmitted from the core node and an up-link data packet directed toward the core node, a terminal station transmitting and receiving at least one data packet to/from the core node and at least one relay node, the at least one relay node relaying the up-link data packet to at least one other up-link relay node and the core node when the up-link data packet addressed to an own node is received, and relaying a down-link data packet to at least one down-link relay node when the down-link data packet address to the own node is received. wherein the at least one core node transmits a route setting packet, said route setting packet includes: sender node identification information,

an up-link receiver side relay node, and a metric indicative of an amount providing

criteria for selecting the up-link receiver side node.

2.   Regarding claim 11 - A radio network comprising: a relay node which forgets all

update metrics corresponding to route setting packets received in the past when a sender

node identification information contained in a currently received route setting packet

matches a current up-link receiver side relay node of own node, the relay node relays a

new route setting packet comprising the update metric corresponding to the currently

received route setting packet as a new metric.

3.   Regarding claim 38 - A relay node relaying at least one of a down-link data

packet initially transmitted from a core node and an up-link data packet directed toward

the core node, and capable of communication with a terminal station, relaying the up-link

data packet to one of an up-link relay node and the core node when the up-link data

packet addressed to an own node is received and relaying a down-link data packet to at

least one down-link relay node when the down-link data packet address to the own node

is received, wherein a route setting packet includes a sender node identification

information, an up-link receiver side relay node and a metric indicative of an amount

providing criteria for selecting the up-link receiver side node from at least one of the core

node and an other relay node.

4.   Regarding claim 70 - A core node connected to a wired network, being relayed at

least one of a down-link data packet transmitted from an own node and an up-link data

packet directed toward own node, and capable of transmission and reception of a data

packet with a terminal station, and transmitting a route setting packet including a metric

indicative of an amount providing criteria for selecting an up-link receiver side relay

node, an up-link receiver side relay node information and a sender node identification

information to the relay node.

5.   Regarding claim 86 - A relaying method for a radio network including a core

node connected to a wired network, relay nodes each relaying at least one of a down-link

data packet transmitted from the core node and an up-link data packet directed toward the

core node, and a terminal station capable of transmission and reception of a data packet

with both of the core node and the relay node, comprising step of relaying the up-link

data packet to other one of up-link relay node and the core node when the up-link data

packet addressed to own node is received and relaying a down-link data packet to at least

one down-link relay node when the down-link data packet address to the own node is

received, wherein the core node transmits a route setting packet including a sender node

identification information, an up-link receiver side relay node and a metric indicative of

an amount providing an indicia for selecting the receiver side node.

6.   Regarding claim 95 - A relaying method comprising: a relay node which forgets

all of update metrics corresponding to route setting packets received in the past and relays

a new route setting packet taking the update metric corresponding to the currently

received route setting packet as a new metric, when a sender node identification

information contained in a received route setting packet matches a current up-link

receiver side relay node.

7.   Regarding claim 120 - A relaying method for a radio network including at least

one core node connected to a wired network, relay nodes each relaying at least one of a

down-link data packet initially transmitted from the at least one core node and an up-link

data packet directed toward the at least one core node, and a terminal station capable of

transmission and reception of data packet with both of the at least one core node and the

relay nodes, comprising: step of detecting arrival of a route setting packet including a

sender node identification information, an up-link receiver side relay node information

and a metric indicative of an amount providing criteria for selecting an up-link receiver

side relay node, step of making judgment whether the up-link receiver side relay node

indicates own node or not upon detection of arrival of the route setting packet, step of

recording a node indicated by the sender node identification information contained in the

route setting packet in a relay node list when judgment is made that the up- link receiver

side information indicates own node, step of taking a measured path loss upon judgment

that the up-link receiver side node relay node information does not indicative own node,

as path loss L_n (n is unique number of a sender node of the route setting packet) between

the node transmitting the route setting packet and the own node, step of reading the

metric $M_{r,n}$ contained in the route setting packet, step of calculating and storing an

update metric from the path loss L_n and the metric $M_{r,n}$, step of comparing the update

metric M_n with the update metric corresponding to the route setting packet received in

the past for making judgment whether the update metric M_n is minimum, step of setting

the update metric M_n to a metric field contained in a new route setting packet and

registering the node indicated by the sender node identification information of the

currently arrived route setting packet as the up-link receiver side relay node of own node

when the update metric M_n is judged as minimum, and step of transmitting the new route

setting packet containing the metric M_n as a new metric M, sender node identification

information indicating identification information of own node and the up-link receiver

side relay node information.

8.   Regarding claim 121 - A relaying method for a radio network including at least

one core node connected to a wired network, relay nodes each relaying at least one of a

down-link data packet initially transmitted from the at least one core node and an up-link

data packet directed toward the at least one core node, and a terminal station capable of

transmission and reception of data packet with both of the at least one core node and the

relay nodes, comprising: step of detecting arrival of a route setting packet including a

sender node identification information, an up-link receiver side relay node information

and a metric indicative of an amount providing criteria for selecting the up-link receiver

side relay node, step of making judgment whether the up-link receiver side relay node

indicates own node or not upon detection of arrival of the route setting packet, step of

recording a node indicated by the sender node identification information contained in the

route setting packet in a relay node list when judgment is made that the up- link receiver

side information indicates own node, step of taking a measured path loss upon judgment

that the up-link receiver side node relay node information does not indicative own node,

as path loss Ln (n is unique number of a sender node of the route setting packet) between

the node transmitting the route setting packet and the own node, step of reading the

metric Mr,n contained in the route setting packet, step of calculating and storing an

update metric from the path loss Ln and the metric Mr,n, step of making judgment

whether the sender node identification information contained in the currently received

route setting packet matches with the current up-link receiver side relay node of the own

node or not, step of forgetting all stored update metrics when the sender node

identification information contained in the currently received route setting packet

matches with the current up-link receiver side relay node of the own node, identification

information contained in the currently received route setting packet does not match with the current up-link receiver side relay node of the own node, step of setting the update metric Mn to a metric contained in a new route setting packet and registering the node indicated by the sender node identification information of the currently arrived route setting packet as the up-link receiver side relay node of the own node when all of the update metrics are forgotten or when the update metric Mn is judged as minimum, and step of transmitting the new route setting packet containing the metric Mn as a new metric M, sender node identification information indicating identification information of the own node and the up-link receiver side relay node information.

9.   Regarding claim 122 - A relaying method for a radio network including at least one core node connected to a wired network, relay nodes each relaying at least one of a down-link data packet initially transmitted from the at least one core node and an up-link data packet directed toward the at least one core node, and a terminal station capable of transmission and reception of a data packet with both of the at least one core node and the relay nodes, comprising: step of detecting arrival of a route setting packet including a sender node identification information, an up-link receiver side relay node information and a metric indicative of an amount providing criteria for selecting an up-link receiver side relay node, step of making judgment whether the up-link receiver side relay node indicates own node or not upon detection of arrival of the route setting packet, step of recording a node indicated by the sender node identification information contained in the route setting packet in a relay node list when judgment is made that the up- link receiver side information indicates own node, step of taking a measured path loss upon judgment that the up-link receiver side node relay node information does not indicate own node, as

path loss Ln (n is unique number of a sender node of the route setting packet) between

the node transmitting the route setting packet and the own node, step of reading the

metric Mr,n contained in the route setting packet, step of calculating and storing an

update metric from the path loss Ln and the metric Mr,n, step of comparing the update

metric Mn with the update metric corresponding to the route setting packet received in

the past for determining a sender node m, is a unique node number, having a minimum

metric, step of making judgment whether the sender node m is the same as the current up-

link receiver side relay node of own node and n # m; step of setting the update metric Mn

to a metric field contained in a new route setting packet and registering the node

indicated by the sender node m as the up-link receiver side relay node of own node when

the sender node m is not the same as the current up-link receiver side relay node of own

node, n = m, and step of transmitting the new route setting packet containing the metric

Mn as a new metric M, sender node identification information indicating identification

information of own node and the up-link receiver side relay node information of own

node.

10.   Regarding claim 125 - A program of a relaying method for a radio network

including a core node connected to a wired network, relay nodes each relaying at least

one of a down-link data packet transmitted from the core node and an up-link data packet

directed toward the core node, and a terminal station capable of transmission and

reception of data packet with both of the core node and the relay node, the program being

executed by a computer for implementing the step of: step of detecting arrival of a route

setting packet including a sender node identification information, an up-link receiver side

relay node information and a metric indicative of an amount providing an indicia for

selecting the receiver side relay node; step of making judgment whether the up-link receiver side relay node indicates own node upon detection of arrival of the route setting packet; step of recording a node indicated by the sender node identification information contained in the route setting packet in a relay node list when judgment is made that the up- link receiver side information indicates the own node, step of taking a measured path loss upon judgment that the up-link receiver side node relay node information does not indicative own node, as path loss Ln, is unique number of a sender node of the route setting packet, between the node transmitting the route setting packet and the own node, step of reading the metric Mr,n contained in the route setting packet, step of calculating and storing an update metric from the transmission loss Ln and the metric Mr,n, step of comparing the update metric Mn with the update metric corresponding to the route setting packet received in the past for making judgment whether the update metric Mn is minimum, step of setting the update metric Mn to a metric contained in the metric of the route setting packet and registering the node indicated by the sender node identification information of the currently arrived route setting packet as the up-link receiver side relay node when the update metric Mn is judged as minimum, and step of transmitting a route setting packet containing the transmission metric M as the metric, sender node identification information indicating identification information of own node and the up-link receiver side relay node information.

11.   Regarding claim 126 - A program of a relaying method for a radio network including a core node connected to a wired network, relay nodes each relaying at least one of a down-link data packet transmitted from he core node and an up-link data packet directed toward the core node, and a terminal station capable of transmission and

reception of data packet with both of the core node and the relay node, the program being

executed by a computer for implementing the step of: step of detecting arrival of a route

setting packet including a sender node identification information, an up-link receiver side

relay node information and a metric indicative of an amount providing an indicia for

selecting the receiver side relay node, step of making judgment whether the up-link

receiver side relay node indicates own node upon detection of arrival of the route setting

packet, step of recording a node indicated by the sender node identification information

contained in the route setting packet in a relay node list when judgment is made that the

up- link receiver side information indicates the own node, step of taking a measured path

loss upon judgment that the up-link receiver side node relay node information does not

indicative own node, as path loss L_n , is unique number of a sender node of the route

setting packet, between the node transmitting the route setting packet and the own node;

step of reading the metric $M_{r,n}$ contained in the route setting packet, step of calculating

and storing an update metric from the transmission loss L_n and the metric $M_{r,n}$, step of

making judgment whether the sender node identification information contained in the

currently received route setting packet matches with the current up-link receiver side

relay node information or not, step of forgetting all stored update metrics when the sender

node identification information contained in the currently received route setting packet

matches with the current up-link receiver side relay node information, step of comparing

the update metric corresponding to the route setting packet received in the past and the

currently obtained update metric M_n when the sender node identification information

contained in the currently received route setting packet does not match with the current

up-link receiver side relay node information, step of setting the update metric M_n to a

metric contained in the metric of the route setting packet and registering the node

indicated by the sender node identification information of the currently arrived route

setting packet as the up-link receiver side relay node when all of the update metrics are

forgotten or when the update metric Mn is judged as minimum, and step of transmitting a

route setting packet containing the transmission metric M as the metric, sender node

identification information indicating identification information of own node and the up-

link receiver side relay node information.

12.   Regarding claim 127 - A program of a relaying method for a radio network

including at least one core node connected to a wired network, relay nodes each relaying

at least one of a down-link data packet transmitted from the at least one core node and an

up- link data packet directed toward the at least one core node, and a terminal station

capable of transmission and reception of data packet with both of the core node and the

relay node, the program being executed by a computer for implementing the step of: step

of detecting arrival of a route setting packet including a sender node identification

information, an up-link receiver side relay node information and a metric indicative of an

amount providing an indicia for selecting the receiver side relay node, step of making

judgment whether the up-link receiver side relay node indicates own node upon detection

of arrival of the route setting packet, step of recording a node indicated by the sender

node identification information contained in the route setting packet in a relay node list

when judgment is made that the up- link receiver side information indicates the own

node, step of taking a measured path loss upon judgment that the up-link receiver side

node relay node information does not indicative own node, as path loss Ln, n is unique

number of a sender node of the route setting packet, between the node transmitting the

route setting packet and the own node, step of reading the metric $M_{r,n}$ contained in the route setting packet, step of calculating and storing an update metric from the transmission loss L_n and the metric $M_{r,n}$, step of comparing the update metric M_n with the update metric corresponding to the route setting packet received in the past for determining a sender node m (m is unique number of node) having minimum metric, step of making judgment whether the sender node m is the same as the current up- link receiver side relay node and $n \neq m$, step of setting the update metric M_n to a metric contained in the metric of the route setting packet and registering the node indicated by the sender node m as the up-link receiver side relay node when the sender node m is not the same as the current up-link receiver side relay node or $n = m$, and step of transmitting a route setting packet containing the transmission metric M as the metric, sender node identification information indicating identification information of own node and the up-link receiver side relay node information.

The closest prior art, either singularly or in combination, fail to anticipate or render the above limitations obvious.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Claims 2-29, 38-62, 70-81, 86-113, 120-122, and 125-127 being allowable,

Prosecution On The Merits Is Closed in this application.

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

1.   Garcia-Luna-Aceves et al. (US 2003/0037167 A1) discloses a unified routing

scheme for ad-hoc internetworking.

2.   Pankaj (US 6,393,012 B1) discloses a system for allocating resources in a

communication system.

3.   Toh (US 5,987,011) discloses routing method for ad-hoc mobile networks.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to John Pezzlo whose telephone number is (571) 272-3090.

The examiner can normally be reached on Monday to Friday from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Hassan Kizou, can be reached on (571) 272-3088. The fax phone number for

the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (571) 272-

2600.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C.

or faxed to:

(703) 872-9306

For informal or draft communications, please label "PROPOSED" or "DRAFT"
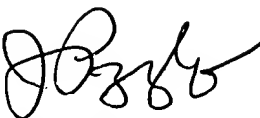
Hand delivered responses should be brought to:

Jefferson Building

500 Dulany Street

Alexandria, VA.

John Pezzlo

4 August 2005

JOHN PEZZLO
PRIMARY EXAMINER